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ABSTRACT

This document presents the theory and learning rationale underlying unit research study as an instructional methodology in elementary secondary education. Defined as "the organization of various activities, experiences, and types of learning around a central theme develcped cocperatively by a group of pupils under teacher leadership," the method is designed to help the student (1) direct his or her own efforts; (2) determine what should be learned; (3) discover where to find answers; (4) learn to work alone and in groups; and (5) learn to draw proper conclusions, make interpretations, and seek relationships. Included in the document are over-all perspectives on organizing the school system for the introduction and ongoing planning of unit research studies, theory behind the practice, the learning rationale, processes involved in the introductory and research phases of the process, and conclusions on the value of the process to the teacher. (MJB)

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VIEWPOINTS

The Unit Research-Study And Its Operation

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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VIEWPOINTS

The Unit Research-Study And Its Operation

Division of Curriculum Development and Pupil Personnel Services
Office of Instructional Services
Georgia Department of Education
Atlanta, Georgia 30334
Jack P. Nix, State Superintendent of Schools
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Introduction

One of the most effective ways of organizing the curriculum content in the instructional program, kindergarten through twelve, is through the selection of unit-research studies. Such an organization enables pupils to study significant segments of content and their relationships, to use research and sharing processes and to enrich their learning through varied activities and instructional materials. The development of the research study centered on small segments of content enables pupils to work together in large and small groups and individually and to accept responsibility for the cooperative planning, execution and evaluation of their continuing work. There exist both organization for research study and sharing along with freedom to plan further action as groups or individuals. There is activity directed toward learning, not just activity for activity's sake.

Definition

A "small segment of content" is both difficult to identify and relative in size. Some teachers today use centers in classrooms or open space which may be simply stations for one or more students or may be subject centers. A question as specific as "Where did the pioneers get their salt?" or "Why did a city grow here?" or "Is the river polluted?" may be used for research by one or more students in a center having a small collection of instructional materials. Further research may be done in the classroom and the media center. A report is given to the teacher and a test of some type is completed. The student(s) move on to other short studies at specified times during the school year.

The administration and organization of such short research studies are involved and extensive for students and the teacher to plan and record. Even scheduling, planning use of materials by one teacher and curricular organizing for units extending four to six weeks are administratively difficult. Further, such small segments of content may inherently limit knowledge and understanding of related broader concepts such as, in the examples mentioned above, the living conditions which the pioneers endured, the economic derivations of cities or the conditions of pollution in the rivers of a region. However, the research process on a specific topic of interest to students does seem to be profitable in student learning. Ideally, then, the small segment of content should be somewhat larger and have greater implications for learning, perhaps in its relationships to research and conclusions to be drawn.

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School System Organization

Unit studies for all grades, for whatever designated period of time, required and/or elective, should be identified so that sequence and choice may be determined. Research-unit studies have been typically three to six weeks in length and may fit into the full year, semester or quarter time patterns. Two to four of the sub-topics or unit research studies are typically placed in a quarter organized course (12 weeks); each subtopic usually stands alone and is completed in the allotted time. At the beginning of the school year or quarterly, the teachers by grade or department decide the sequence of conducting the unit research studies so that all of the designated instructional materials identified in the curriculum guides may be moved into the appropriate classrooms for the duration of the studies. For purposes of economy, care must be taken in this planning, since conducting any unit study by more than one teacher at a time necessitates the purchase of duplicate sets of instructional materials. In general, desirable usage of materials is 50 percent of the time in any school year, but more or less usage will occur depending on organization of the curriculum offerings and student choices.

Traditionally, the elementary school, kindergarten through grade eight, has been devoted to general education. Common content, understandings, attitudes and skills have been studied. Student-teacher choices were allowed *within* the selected common study. Particularly has this practice been true in the junior high-middle school which though designated "exploratory," most often meant exploration of several subject fields. For most subject fields Georgia's school systems may choose the emphasis, even in required Georgia history and health (except drug study). How to organize study in the subject fields is a local perogative. Whether to require all unit research studies of each student in grades kindergarten through eight or to allow a choice of at least one-third or one-quarter of the studies to be elective is a decision the local school system must make. Certainly if units are required of all, there must be concentrated effort to provide good instruction, similar objectives, differentiated content and different levels of instructional materials. In departmentalized grades, usually grades five and up, quarter courses as combinations of two or three unit research studies will need to be prepared. Combinations are more difficult to schedule and some school systems are attempting to schedule quarter courses over a two year span (5-6; 7-8; 9-10; 11-12) to provide flexibility and to economize in purchasing sets of instructional materials. Regardless of the pattern, a plan for the sequence of unit research studies in all subject fields must be prepared by all school systems. Examples of organizational patterns of unit research studies in science, social studies and language arts are available from the curriculum division of the Georgia Department of Education.

Overall Annual Time Requirements

In Georgia public schools grades K-8 the basic overall time allotment in each subject field must be at least 30 minutes daily or the annual equivalent. The equivalent is interpreted as one semester or two quarters. It is suggested that longer blocks of time, one to one and one-half hours, can be scheduled for effective research activities. Courses in addition to those required in the one semester or two quarters may be elective depending on scheduling or teacher-student planning as the school system chooses. In the senior high school, state and local requirements within broad subject fields are adopted and measured as carnegie units or quarter hours. The high school curriculum contains required and elective courses, balanced between the needs of the society and the needs of individuals.

Theory

The explosion of knowledge and growing space age achievements present a tremendous challenge to teachers, principals and supervisors to select and organize the learning experiences of children. Schooling should be directed toward providing adequate and effective living for today and continuing in the years ahead.

Unit research planning and teaching is one of the best ways to provide learning experiences on a sufficiently broad base to meet the requirements of living in today's world. Research-type teaching has been defined as the organization of various activities, experiences and types of learning around a central theme, problem or purpose, developed cooperatively by a

group of pupils under teacher leadership. The total teaching act – planning, execution of plans and evaluation of results – is demanded of teachers and students.

There are many advantages of unit research teaching over the very common total group and individual plan of teaching. Each student achieves success in learning. His, or her, own desire is to learn, not because the teacher or the course requires compliance; rather, the student accepts the responsibility for his, or her, learning. The student imposes tasks on himself and realizes the joys of learning beyond the fondest dreams of the teacher, although sometimes not exactly as the teacher would have desired. The student learns to operate in groups of varying sizes and purposes such as are encountered in daily life. He, or she, learns to retain his, or her individuality and yet achieve group goals as well. Individual learning becomes increasingly appealing, since the student constantly is discovering alluring tid-bits of information in individual or group research.

Through unit research planning and teaching, the learning experiences of pupils can be kept current, vitalized and brimming with challenge. Areas of learning can be large enough in scope to hold values and interests for every person in a group; they can provide for sufficient depth in study to satisfy the most earnest student. The large segments of any content area can be either topical, chronological or elemental. All subjects can be divided into small segments of learning occupying three to six weeks in time.

Unit research teaching and learning, when the potentialities of this process of organizing a class are fully realized, offers excellent means for developing learning experiences for students of differing abilities. The very process of grouping, both by abilities and by interests, so characteristic of good teaching, makes it possible to help students of gifted, retarded or average abilities to work in accordance with their capacities. Not only do they work in compatible groups, but there is also considerable opportunity for independent study and individual progress. A student is not held back by uniform lessons for the entire class or by uniform materials. There is much opportunity for specialization and for differentiation, for wide reading of varied materials, for different kinds of learning activities for students of varying interests, backgrounds and abilities.

Learning Rationale

At this point an examination of the psychology of learning underlying the research study process is necessary. Why should there be total class, small group and individual activities in the organization for learning? Why study from more than one source such as a textbook? Can the whole class get enough from the small groups? In a large topic, is there not too much to undertake in six weeks?

Learning has a logical arrangement. The research-type organization for learning is based upon a Gestalt or organismic psychology in which figure-field relationships are important. Single elements or items have relationship with all other elements in their field or area in research-type learning. A student shares certain relationships with all other persons, with small groups and within himself. The continual reconstruction of the figure-field relationships creates both diversity and commonality. Insight is a significant element of learning. The learner explores a new area of content to discover information, avenues of meaning and relationships among ideas. As the student gains information and understanding, explores lines of connection and analyzes, insight develops. New figure-field relationships are perceived and the learning process continues.

Learning has a psychological aspect. Learning is finally individual, even though it occurs within the action of individuals, small groups, the total group. Motivation, too, is finally individual, even though it operates within the web of individual, small group and total group forces. Learning and motivation from within the individual, then, usually are more effective than which occurs from external sources. Any learning process should stimulate learning for the sake of learning; yet, it should be recognized learning may also be required by outside forces. Similarly, there must be balance in motivation. The unit research process outlined in this publication utilizes the various learning and motivational forces effectively. In school as a student, an individual must work in situations which are similar to those in which he participates in other life roles, whether as a child or as an adult.

The Introductory Phase

Objectives or Goals

There are many ways of initiating a research study: lecture, film, filmstrip, examination of available materials, field trip, laboratory demonstration, reading textbooks or using other resource material. A period of time up to a week may be spent in a general overview of the research study area. Toward the end of this period, a planning session should be used to identify questions or informational areas for study. Questions or informational areas should be grouped into major subdivisions of content.

Objectives for study stem from the overall subject field or course objectives which should appear in the overall curriculum guide for a subject or level of education. There should be a continuum of objectives from the very general to the specific. Specific objectives must be chosen for the research study being planned, and they may or may not include the whole range of objectives. Usually a few significant objectives for a given research study are adequate and much more effective and usable in carrying out a research study than a long list of objectives. Other sub-objectives will be identified in planning. The teacher and students will break down these general objectives or goals into questions or information to be sought during the introductory sessions. Other questions or information will be added throughout the research process.

At the beginning of the school year or the quarter, it is wise for the teacher to state to the students the overall objectives of the course and to describe the various research studies to be carried out. Usually, teachers set the stage for a new study by arranging their classrooms in such a way as to arouse the interest of the students and provide a challenge for learning. A committee or group of students may assist with this preparatory work.

Almost as many ways of initiating or approaching a research study are possible as there are study topics. However, some types of learning activities tend to be more effective in the early stages of the research study than others. Among these are planning, securing and organizing materials, using audiovisual aids, interviewing people and taking exploratory trips. This introductory phase of a research study usually occupies up to one week of the time allocated to the unit.

Content

Major concepts to be developed through the research study should be stated as clearly as possible. The most significant concepts are usually given headings in curriculum guides as the content objectives, main ideas, questions, statements, generalizations or similar labels. Identification of the generalized knowledge to be sought is extremely important to the learning situation, for teacher and students then know what research is to be undertaken and evaluated. It is wise to state these generalizations as questions, using the language of the students, as the research is planned. Often new ideas are discovered and added as the research, discussion and reporting progress. It must be remembered that the thorough and extensive development of the basic concepts of a given subject field usually requires many learning experiences, often over a period of years. This fact makes it important to know what these concepts are and which are most appropriate to a given experience and age level.

Planning for Teacher, for Student and for Both

The planning session involving students and teacher is a critical stage in unit research teaching. The teacher must have planned overall goals, content areas and general skills to be learned. He/she should have in mind general or common learnings, some small group learnings and their contributions to large group learning, individual learning materials plus library resources. The teacher should know the many ways to organize a class and should vary the process as the class study unfolds. As students approach this planning session they will know, after experience with the research process, its general outline. In fact, they should grow to be highly competent in planning. Students will learn the most objective introductory activities – lectures, presentations, audiovisual materials, etc. Further, they will learn to secure and use the basic room-research study materials collection; they will know that they must read widely in the beginning stages of study in order to identify content areas. Thus, when the planning session is initiated, the teacher and students should have adequate general information to undertake more specific planning.

The planning session must be both structured and at the same time freewheeling, using brainstorming and other similar techniques. The demands of research study make it structured, while it can be creative in the sense that the content areas can be varied as the student backgrounds and interests change. However,

care should be taken to see that students' thinking is not hindered by worry about English form or grouping of questions or statements. Careful editing, if necessary, is the follow-up step of the planning session. It is wise, in this planning period, to have students record on the chalk board the content areas and the questions or statements; the teacher needs to be free to conduct the discussion. Care must be taken to see that the continuum from specific facts to interpretations and generalizations is adhered to in statements or questions applying the who, what, when and why criterion. The final judgment as to comprehensiveness is to be made by the teacher. The teacher will introduce in the planning session all of the areas of content to be covered.

After the planning session has elicited all possible questions and statements from the teacher and students, organization or structure should be attempted. The questions or content statements should be organized so that learning tasks are identified for the total group, for the small group and for the individual. These should be printed on charts in outlines and placed where all students can see and use them.

Planning of time allotment should follow immediately. For example, one week may be taken up for introductory study and planning. One to three weeks should be taken up in research and study. One week should be spent in reporting by small groups. One week should be given to review, testing and review of test. Variations from these suggestions may be made if the research study is to be shorter in time, breadth of content or interest. Three to six weeks depending on the interest of students seem to be most effective.

The teacher allots time to specific activities for the entire research process. He or she must outline activities which involve the whole class and those in which the class will work in small groups. Time must be allotted weekly for short group reports. Time is so precious that each activity must be carefully selected and planned. Students should be made aware of the time schedule and, to the extent possible, the activities to be used.

As the time allotment and tentative schedule of activities are proposed, the selection of small group activities by students should be made in another planning session. Some criteria for student choices are these.

1. The student must vary his interests and channel his study to the total subject area. He must not pick the same topic area each time in the succession of research studies.
2. Capabilities of students must be considered.
3. Personal relationships between students, both positive and negative, should be considered.

The teacher must make clear his or her own specific responsibilities. For example, teachers in most instances manage instruction which involves all students. Parents or students who have traveled widely may also contribute to the study; or in science, as an example, the teacher may select certain pertinent demonstrations. A teacher may also assume certain responsibilities in small groups; in fact, there are many instances where his or her superior knowledge and skill demand this role for the teacher. However, care must be taken not to allow students to overload the teacher with student tasks or to allow the teacher to supply answers.

Finally, in planning, students must be made aware of the need to expand and clarify the original questions, statements or problems as they study in large group and in the small group. By the time the small group reports to the whole class, a more comprehensive outline of content will have been discovered and prepared.

It is necessary to note here that planning should proceed more rapidly with older and more experienced students. A further point of warning should be made. As teachers work through research studies many times, the content, questions, statements, planning and process tend to become routine. Teachers should force themselves to follow through the initial planning procedure with students and to try new activities each time they undertake any unit research study.

Research Activities

Time should be taken immediately after the initial planning period to review process skills and to suggest broadly the activities. Many and varied kinds of activities should be discussed. Above all, planners should be certain that balance and variety are attained in the kinds of activities suggested in the successive research studies. The teacher should know when to use all the methods available to him and the group. Panels, discussions, charted materials and outlines, for example, are most often used for presentation by students, but care must be taken by students and the teacher to vary these devices and methods. Concrete activities such as the making of charts, models and dioramas, drawing pictures and murals, collecting, mapping and making picture poems, consume more time during students' earlier years and less as the students approach adulthood. However, the appeal

of film and television must not be overlooked for older students and adults.

The success of any chosen activity is measured by the degree to which its purpose is attained. Activities are (1) introductory or exploratory, (2) informational, (3) expressional and (4) evaluational. The whole class, the small group and the individual do some of each. Information, facts and pertinent data must be gathered, discussed, assimilated and succinctly presented. Facts alone without synthesis, interpretation and evaluation exist in a vacuum. Activities, too, must have purposes; they must contribute to the development of understanding, insight and skill. Expressional activities mean outlining, writing, discussing, observing, questioning and listening carefully. Evaluational activities involve synthesizing, interpreting, judging and drawing conclusions. "What do you find" and "why is it so" are the twin goals of all research activities.

Materials

It is the task of the central office staff, the principal, the librarian and the teacher to acquire a balanced and extensive unit collection of all types of instructional materials for the various research-type studies. The instructional materials center should contain these materials. As materials are gathered, judgment should be made as to their use. General materials which receive constant use such as textbooks, globes, maps, charts and filmstrip projectors should be accessioned through the library and placed permanently in the classrooms of teachers who will use them. Multiple copies of many of these materials of general importance should be purchased. Basic collections of all types of materials most appropriate to a particular research study should be placed in the storage room in the media center. Specific materials – those which are difficult or contribute to depth in knowledge, supplementary interest selections such as fiction or biography, or those which are expensive or very specialized – should be located and retained in the media center for small group and individual use. Fewer multiple copies of these specialized and expensive materials should be bought. In the school today, basic, general research is usually done in the classroom and specialized research is undertaken in the media center.

The research study collections travel to the classrooms where the basic classroom research can be conducted by students and directed by the teachers. Teachers plan their research studies so that they pursue different studies at different times during the school year. When two or more teachers must teach the same research study at the same time, basic collections must be duplicated in the library. By planning research studies cooperatively and by careful scheduling throughout the school year, teachers can have large collections of materials available to them in the classroom.

The specialized collections must be retained in the media center. Small groups and individuals may use the media center whenever possible. The teacher may schedule with the media specialist for a small group or an individual to go from the classroom to the media center. Where study halls are available, the teacher may also schedule with the media specialist for a student to go to the media center. The media center also should be open before school and after school at designated hours.

Under this plan for organizing materials, the whole school radiates from the media center. In the large school of today, this plan is a necessity. It is physically impossible to get 600 to 1,800 students in the media center. The media specialist cannot direct all the research necessary for large numbers of students; the teacher must and should help at least in the basic room research. When all students make the same research study at the same time, limited amounts of material are available to all of them. Planning research studies at different times during the year will make large collections of materials available to a few students at a time, but eventually to all of them.

The Research Period

The major portion of the total allotted time — approximately one-third to one-half — should be devoted to research. The teacher should re-state the total class requirements, set up the necessary research tasks and outline the presentations, the time and the activities necessary to get the research studies completed as planned. Then he or she should divide the total class into small groups and allot the time to be spent in research. Of course, there should be as many small groups as there are sub-topics, but other factors operate to dictate the size of the small groups: the sub-topics should have sufficient scope; the capabilities of the small group and, for that matter, the whole class must be considered; student leaders most often can lead groups of four to six persons most effectively; the teacher must know how to direct the on-going operation of such groups in the research process; the new teacher may not attempt to handle as many groups as the more experienced teacher.

After overall planning has been accomplished, the small groups will undertake much of the same type of organizational process as the total class has just completed. The group leader must be chosen; some teachers like to appoint this person, but it is interesting to let students choose their own group leaders. Good criteria for the selection of leaders should have been determined in the initial planning phase of the year. A whole staff and, eventually, all students, may identify these criteria.

Students then should select and collect all the materials they can on the chosen topic. They must plan to share with other small groups the general classroom or basic materials. Basic overall scanning of all material follows; then more specific questions, statements and objectives are formulated. Other statements can be added as research goes on. The teacher should move from group to group, helping with each of these steps during the research phase. In-group activities should be planned and basic reports to the total classroom group discussed. Tasks should be selected by individual members of the group. It is often better to let individuals assume such tasks rather than to work in pairs, but in some cases, two can and should work together. Often a bright and a slow person may work together. These plans must be carefully worked out between the student leader and teacher. In many instances, the tasks selected by the students stem from individual interests. The alert teacher stimulates this individual study, for lifetime interests often develop during this phase of the research study.

At least once a week during the study, a progress report should be given by the small group to the total class. Rough drafts of questions, problems and statements under study by the small group should be posted on the bulletin board as soon as possible for the information of the total class. The teacher should know all individual assignments and individual interests; he or she should keep a record of these in his or her notebook.

A teacher should present the information to be studied by all students at varied times. A brief portion of the period or the whole period may be used for total class activities. There may be brief lecture, a film, globe, map or chart study, a discussion of a portion of a textbook, an experiment or a filmstrip — any presentation the teacher feels would benefit all students.

In the presentation of subject matter primarily logical in nature, e.g., mathematics, more time is spent on common activities for the whole group. Elective or specialized courses require more common effort by all students. Care must be taken, however, to provide other types of learning and motivation. In the "required" courses a balance of learning and motivational experiences from individual to total group is essential, since all students must take those subjects.

The small groups should begin through conferences to plan how to present their information and understandings to the whole group. A panel can be planned. What each person will do is assigned. Charts, diagrams, colored graphs and dittoed outlines are prepared. The final copy of the questions, objectives, statements or other presentations of content is also prepared for students. Students must develop the ability to summarize, to translate the ideas found in the sources used in the research into their own words and materials. Communication of these ideas to the small and large group is highly important.

Certain students may be scheduled to report to the group if they have attempted individual study. Some or all may turn in reports to the teacher or place them on display for students to see. At this time final plans should be in progress for reporting by the small groups to the whole class.

As the research continues and the time for reports nears, the teacher will often review and test students on the activities involving the total class. Points needing reteaching can be identified before the research

study ends. Some teachers test more often than others on segments of common learnings. Well prepared tests directly related to objectives, questions or statements rather than "pop" tests are usually more successful.

Reporting

Reports to the whole class should be carefully planned and well presented. In too many instances, perfunctory or too detailed reports are allowed. A variety of presentation methods should be used, and afterwards all pertinent points should be reviewed and discussed by the teacher and students. When the reports are made, the teacher must be certain that all of the specialized information which the small group has decided to present is understood by the total group. A week to 10 days is usually spent in these small-group presentations.

The total group of students either has a dittoed report by the small group, or bulletin board summaries, or the students must take notes. Even though a prepared report is given to students, it is wise for students to learn the skills of taking notes for use as personal reminders when preparing for tests.

Time should be taken by the teacher and students to discuss, to analyze and to interpret each report. The information so gained should produce generalizations to be acquired by the remainder of the class as well as the reporting group. The reporting process will give helpful experience in receiving and analyzing group data.

Reviewing

After all information has been presented and interpreted, it is wise to review all data with the students. Questions which were studied by the small groups, posted around the room on charts, information from bulletin boards or the notebooks of students are used for review purposes. Students often serve as "experts" on the particular statements, questions or objectives they researched. Various sources of information are recalled. Discussions which were held are summarized. As much as possible, quantity and quality are drawn from the entire research study. Skills of analysis and synthesis are sought. This time is a critical period for the teacher and students and the learning recall is usually enjoyed by students if they are allowed to serve as consultants on their special interest phases of research.

Evaluation

Content and procedural evaluation are integral to the research process. Certainly the content is important at a particular time or place, but the skills by which the content is acquired assume larger importance as the student approaches adulthood. Seeking answers; working at times alone, in a small group and in a large group; searching, analyzing and interpreting – these are the long range skills to which a student must be directed in each unit research study. Where there is need for improvement, a student should be notified in a private conference, but generally, small or large group suggestions will suffice.

The development of internal motivation must be foremost among the teacher's goals in evaluation. Teacher and parent approval, peer approval and grades are potent stimulators, but self-motivation is the lasting motivator. It is a common fault to over-use external stimulation for laggard students, but these stimuli basically lose their potency with the maturing student. The shrewd and competent teacher learns through experience to develop self-appraisal, self-competition and thus self-responsibility.

The teacher and students gain an evaluation of their study from group and individual speaking and writing activities. Presentations, experiments, reports, individual papers and assigned readings all provide evaluation opportunities. Certainly the work and study skills exhibited by students should be carefully examined by the teacher and discussed with them individually or in groups. In the unit research study the opportunity to observe work and study habits may be the most profitable means of evaluation.

In the research study, there should be less fragmented information, with the possible exception of certain types of material in the common learnings undertaken by the total class. "Pop" or short tests are then difficult to construct. More importance is placed on the final test or battery of tests. The teacher must use all the skills of test-making in order to prepare comprehensive, fair and effective tests. Questions eliciting facts, analysis, interpretations and reasoning must be constructed for each major objective or topic. Questions must vary from those answerable by all to those answerable by few or none.

There must be many types of test questions. The forward-looking teacher keeps card files of test questions and exercises under the headings of the objectives. After the tests have been administered and returned to students, the teacher usually spends another brief time in review to correct errors.

All phases of evaluation, then, should contribute to the final teacher judgment of the student. The teacher will have determined by agreed upon policies of the school system what consideration and what weighted

value will be given to the student who works up to his capacity and reasonably well in completing his tasks.

Skills

Students have to develop the skills involved in each step of the research study. Foremost is the direction of their own efforts without assignment from the teacher. Since the learnings are not so clearly designated as in the usual textbook presentation, the student must seek out basically his own facts, make an analysis and interpret the data. Clearly there is direction by the teacher, but if there is too much, the student sits around waiting to be told. Or conversely, non-direction promotes chaos.

A second skill is that of determining what should be learned. Recognizing the problem, the area to be learned and the content are beginning points of long-range learning. Exploring the many facts of a problem is a prerequisite to making good judgments or deriving synthesis.

The third skill – knowing where to find answers – is a major life skill. Someone has said, "The half of knowledge is to know where to find it." Neophytes will go to one source – the teacher, the textbook, the encyclopedia – while the person skilled in finding answers will seek answers from many sources. Even then, it is difficult to judge the truth of the situation or problem.

Learning to work alone and yet with other people in seeking solutions to problems, to questions and in unknown areas is the fourth skill. The paradox of the individual and the group is not easily solved. It is not an "either-or" skill but a "both-and." Other skills are those of careful gleaning of a mass of information for the most pertinent data, spoken and written. Clear, lucid presentations based upon carefully researched facts are most desired.

A final skill is that of drawing proper conclusions, making meaningful interpretations and seeking relationships. The intelligent citizen must make many critical judgments and decisions in his or her life. Any up-grading of the abilities to make judgments should certainly improve the individual and society.

Conclusions

Since research-type learning involves the in-grained values of individuals and the inconsistencies of individuals in learning, a teacher works all his life to become competent in employing this process of organizing for learning. The process is simple as one views it on the surface, but underneath it involves all that is known and is being learned about the psychology of learning. The professional teacher employs this process of organizing for learning in all subject fields. He or she varies it according to the students and the subject matter; the teacher is careful to develop a research approach with all subject matter. At this point, the teacher sees darkly through the learning glass, but there is no greater enjoyment than exploring the means of research-type teaching for achieving more effective learning.